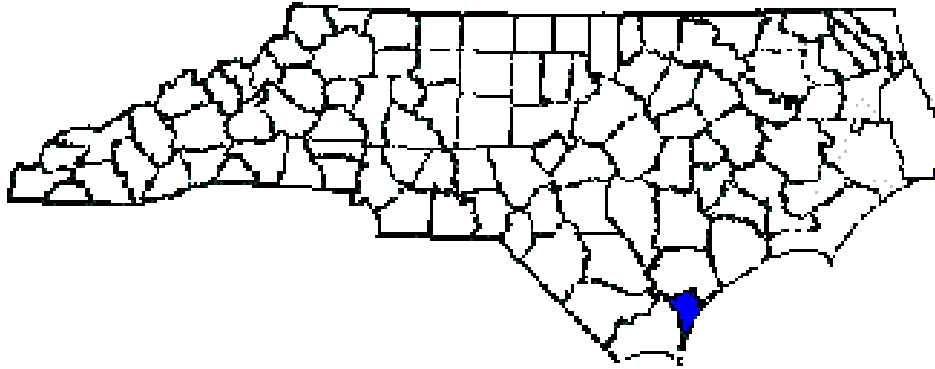


ANNUAL REPORT FOR 2006



Third Street Bridge Mitigation Site
New Hanover County
TIP No. U-0092A



Natural Environment Unit & Roadside Environmental Unit
North Carolina Department of Transportation
December 2006

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SUMMARY

The following report summarizes the monitoring activities that have occurred in 2006 at the Third Street Bridge Mitigation Site. The 2006-year represents the first year of hydrology and vegetation monitoring following construction. The site must demonstrate hydrologic and vegetation success for a minimum of five years or until the site is deemed successful. The site was constructed to serve as mitigation for impacts associated with the construction of T.I.P. U-0092A for the Smith Creek Parkway in New Hanover County.

In May 2006, groundwater gauges were installed to monitor hydrology on the site. Two groundwater gauges, a surface gauge and one rain gauge were positioned on the mitigation site. Hydrologic success criteria are based on the approved mitigation plan and require that the site demonstrate inundation or saturation within 12" of the surface for 12.5% of the growing season. The 2006-year represents the first year of hydrologic monitoring for the Third Street Bridge Mitigation Site. Both groundwater monitoring gauges indicated that the site met the jurisdictional criteria for wetland hydrology above the required 12.5% of the growing season. The surface water gauge also showed periods of inundation during the 2006 monitoring year. Vegetation monitoring in the hardwood area yielded 509 trees/shrubs per acre. which is well above the minimum success criteria of 320 trees per acre.

Based on the results from the first year of monitoring, NCDOT will continue to monitor vegetation and hydrology at the Third Street Bridge Mitigation Site during 2007.

1.0 INTRODUCTION

1.1 Project Description

The Third Street Bridge Mitigation Site is located in New Hanover County adjacent to the Smith Creek Parkway. Totalling 1.3 acres in size, the site provides bottomland hardwood forest creation mitigation for a portion of the wetland impacts associated with U-0092A.

1.2 Purpose

In order to demonstrate successful mitigation, hydrologic and vegetation monitoring must be conducted for a minimum of five years or until the site is deemed successful. Hydrologic success criteria are based on the approved mitigation plan and require that the site demonstrate inundation or saturation within 12" of the surface for 12.5% of the growing season. Vegetation success criteria states that at least 320 trees/shrubs per acre must survive after the completion of the third growing season and 260 trees/shrubs per acre after the fifth growing season. Included in this report are analyses of hydrologic and vegetation monitoring results, discussions of local climate conditions throughout the growing season and site photographs.

1.3 Project History

Spring 2006	Site Constructed
February 2006	Site Planted
May 2006	Monitoring Gauges Installed
May-November 2006	Hydrologic Monitoring (Year 1)
June 2006	Vegetation Monitoring (Year 1)

2.0 HYDROLOGY

2.1 Success Criteria

The hydrologic success criteria established for the Third Street Bridge Mitigation Site, as stipulated in the approved mitigation plan, require that the site demonstrate inundation or saturation within 12" of the surface for 12.5% of the growing season.

The growing season in New Hanover County begins on February 27 and ends November 26. The dates correspond to a 50% probability that air temperature will drop to 28° after February 27 and before November 26¹; thus, the growing season is 271 days. Local climate must represent normal conditions for the area.

2.2 Hydrologic Description

Two groundwater monitoring gauges and one surface water monitoring gauge were installed within the sites' restoration area in May 2006 (Figure 2). The groundwater gauges record groundwater level once per day and the surface water gauge records surface water readings every three hours. A rain gauge is also located on the site to assist in comparison of the rainfall data (supplied by the NC State Climate Office) from an official weather station in Wilmington. Monitoring data for 2006 represents the first year of hydrologic monitoring for the site.

2.3 Results of Hydrologic Monitoring

2.3.1 Site Data

The maximum number of consecutive days that saturation occurred within 12 inches of the ground surface was determined for each groundwater monitoring gauge. This number was converted into a percentage of the 271-day growing season (February 27 – November 26). Table 1 provides the 2006 hydrologic results; Figure 3 is a graphical representation of these results. Appendix A includes graphs of the data recorded at each groundwater and surface water gauge. Daily rainfall events recorded at the official weather station in Wilmington are included on each of the groundwater gauge plots.

¹ Soil Conservation Service, Soil Survey of New Hanover County, North Carolina, 1989.

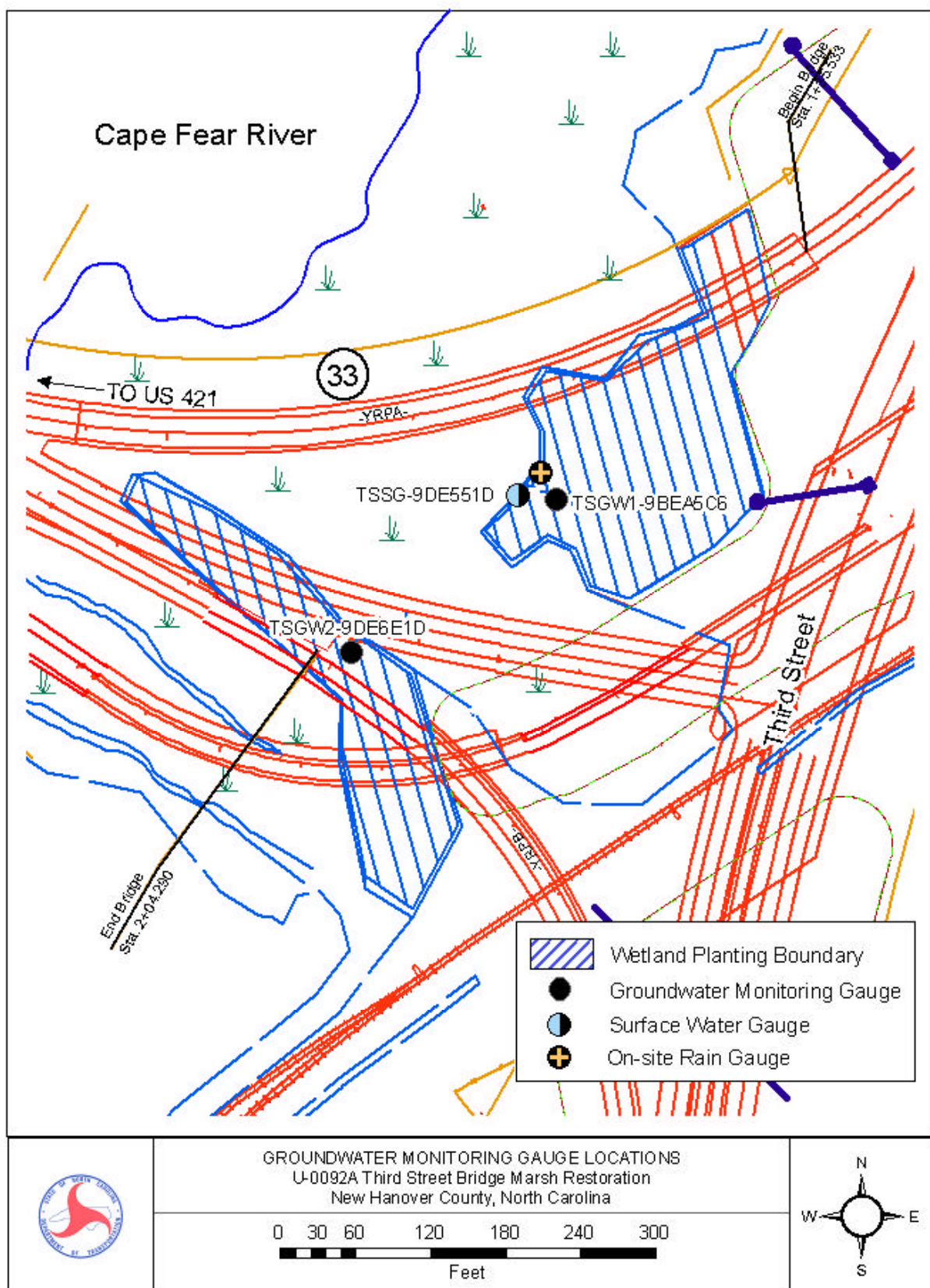


Figure 2. Monitoring Gauge Location Map

Table 1. 2006 Hydrologic Monitoring Results

Monitoring Gauge	< 5%	5-8%	8-12%	> 12.5%	Actual %
TS-GW1				X	13.2
TS-GW2				X	29.4

Both groundwater monitoring gauges indicated that the site met the jurisdictional criteria for wetland hydrology. The surface water gauge also showed periods of inundation during the 2006 monitoring year.

2.3.2 Climatic Data

Figure 4 is a comparison of the 2006 monthly rainfall to the historical precipitation (collected between 1976 and 2006) for Wilmington, North Carolina. This comparison gives an indication of how 2006 relates to historical data in terms of climate conditions. The NC State Climate Office provided all local rainfall information.

This graph is used to indicate the general precipitation conditions for the surrounding area. Overall, 2006 exhibited normal rainfall. The data obtained for the 2006-year indicates that rainfall in June, August, October and November were above normal. The months of January, March, May and July tend to be on the low side of normal. Rainfall for the months of February, April and September were normal.

2.4 Conclusions

The 2006-year represents the first year of hydrologic monitoring for the Third Street Bridge Mitigation Site. Both groundwater monitoring gauges indicated that the site met the jurisdictional criteria for wetland hydrology above the required 12.5% of the growing season. The surface water gauge also showed periods of inundation throughout the monitoring year.

NCDOT will continue to monitor the Third Street Bridge Mitigation Site for hydrology.

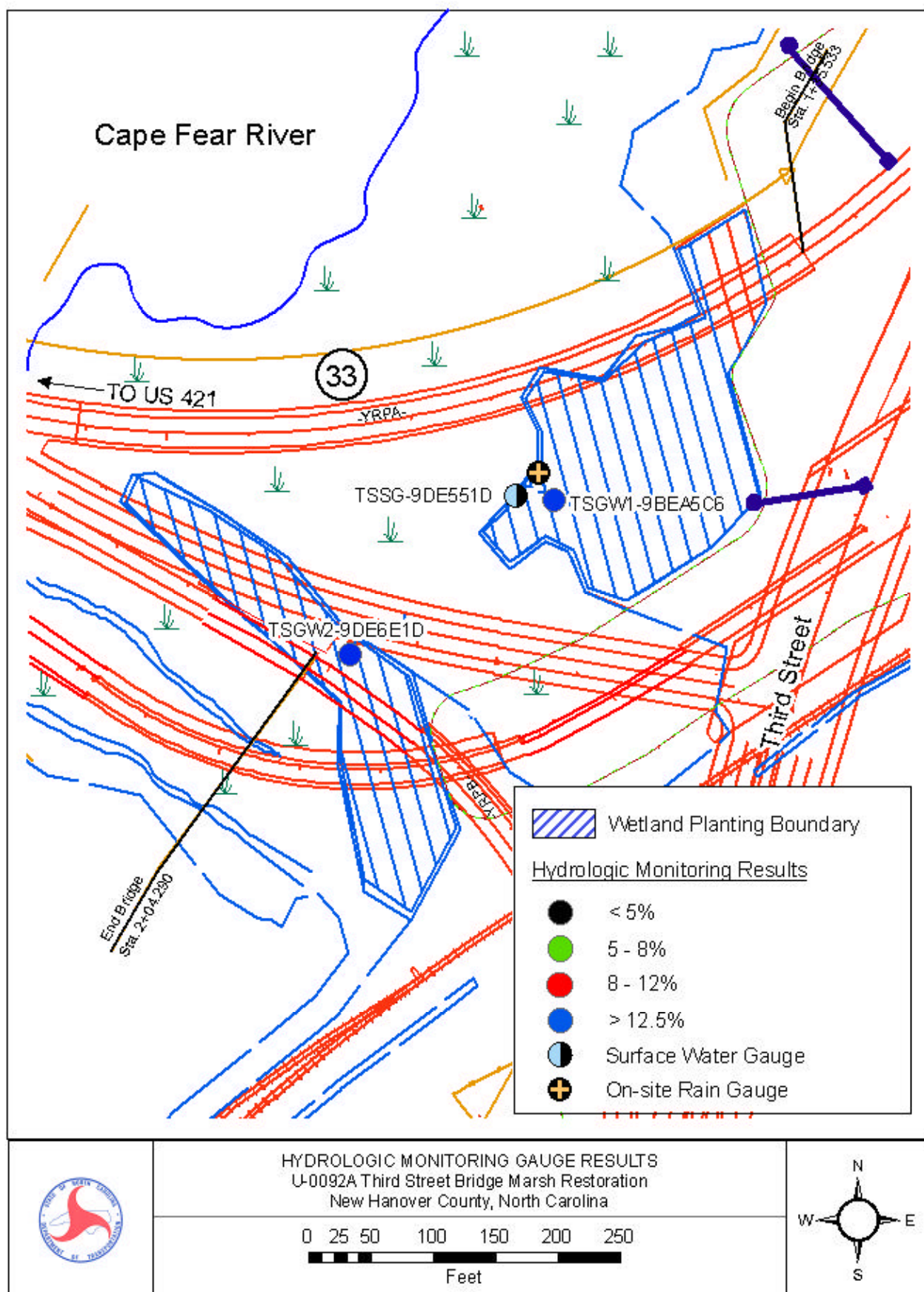
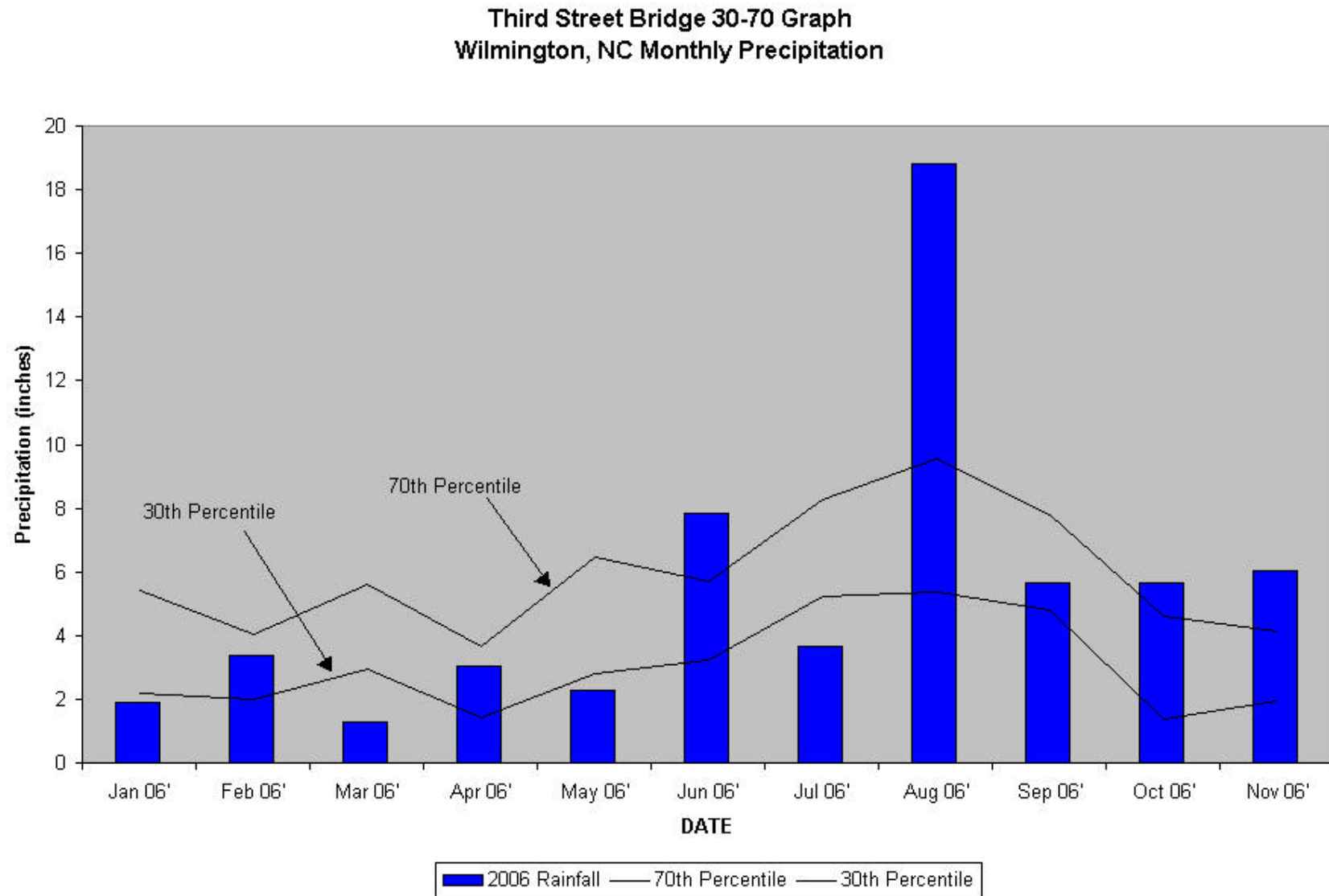


Figure 3. Hydrologic Monitoring Results Map

Figure 4. 30-70 Percentile Graph, Wilmington, NC



3.0 VEGETATION: THIRD STREET BRIDGE MITIGATION SITE (YEAR 1 MONITORING)

3.1 Success Criteria

Success Criteria states that at least 320 trees/shrubs per acre must survive after the completion of the third growing season and 260 trees/shrubs per acre after the fifth growing season.

3.2 Description of Species

The following tree and shrub species were planted in the Wetland Restoration Area:

Tree Area:

Fraxinus pennsylvanica, Green Ash

Taxodium distichum, Baldcypress

Quercus lyrata, Overcup Oak

Nyssa aquatica, Water Tupelo

Nyssa sylvatica var. *biflora*, Swamp Blackgum

Shrub Area:

Cephalanthus occidentalis, Buttonbush

Aronia arbutifolia, Red Chokeberry

Alnus serrulata, Tag Alder

Itea virginica, Virginia Sweetspire

3.3 Results of Vegetation Monitoring

Plot #	Green Ash	Baldcypress	Swamp Blackgum	Water Tupelo	Overcup Oak	Buttonbush	Red Chokeberry	Tag Alder	Virginia Willow	Total (1 year)	Total (at planting)	Density (Trees/Acre)
1 (Trees)	18	17	5	5	4					49	52	641
2 (Shrubs)						6	8		11	25	45	378
Average Density (Trees & Shrubs/Acre)												509

Site Notes: Other species noted: cattail, *Juncus* sp., phragmites, *Pluchea* sp., sedge, *Cyperus* sp., *Baccharis* sp., *Scripus* sp., *Sagittaria* sp., and various grasses.

3.4 Conclusions

There were 2 vegetation monitoring plots established throughout the 1.7 acre planting area. The 2006 vegetation monitoring of the site revealed an average tree density of 509 trees/shrubs per acre. This average is well above the minimum success criteria of 320 trees /shrubs per acre. NCDOT will continue to monitor the Third Street Bridge Mitigation Site.

4.0 Overall Conclusions/Recommendations

The 2006-year represents the first year of hydrologic monitoring for the Third Street Bridge Mitigation Site. Both groundwater monitoring gauges indicated that the site met the jurisdictional criteria for wetland hydrology above the required 12.5% of the growing season. The surface water gauge also showed periods of inundation throughout the monitoring year. Vegetation monitoring in the hardwood area yielded 509 trees/shrubs per acre which is well above the minimum success criteria of 320 trees per acre.

NCDOT will continue to monitor the Third Street Bridge Mitigation Site for vegetation and hydrology.

APPENDIX A

GAUGE DATA GRAPHS

APPENDIX B

PHOTO AND VEGETATION PLOT LOCATIONS, SITE PHOTOS

Third Street



Photo 1



Photo 2



Photo 3



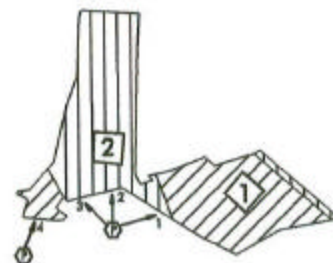
Photo 4

May 2006

DATE: 10/10/10
 DRAWN BY: J. L. HARRIS
 CHECKED BY: J. L. HARRIS
 SCALE: 1" = 100'

PROJECT: 10-00000000
 SHEET: 10-00000000
 DATE: 10/10/10

3rd Street Mitigation Site



- Tree Area
- Shrub Area
- Plot Locations
- Photo Locations

10-00000000
 10-00000000
 10-00000000